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Appl. No. 10/057,929
Amendment dated March 2, 2004
Reply to Office Action of January 2, 2004

Amendments to the Specification:

Page 14, after line 5, please add the following new paragraphs:

Fig. 2 is a schematic partly developed and partly sectional view showing several additional stages of making a composite filter mouthpiece.

Fig. 3 is a schematic partly developed and partly sectional view showing further additional stages of making a composite filter mouthpiece.

Page 14, line 6, please amend the paragraphs beginning on line 6 and ending on line 14 as follows:

Fig. [[2]] 4 is a view of a detail of the structure which is shown in Fig. 1;

Fig. [[3]] 5 illustrates the structure of Fig. [[2]] 4 but with one of the parts in a different axial position;

Fig. [[4]] 6 is a view similar to that in the upper part of Fig. 1 but showing certain parts of a different machine; and

Fig. [[5]] 7 is a view similar to that of Fig. 4 but showing a portion of a third machine.

Page 15, please amend the paragraph beginning on line 1 and ending on line 17 as follows:

The upper and lower portions of Fig. 1 show certain parts of a filter mouthpiece making machine, and the The central portion of this Figure Figs. 1-3 illustrates a series of filter mouthpieces during different stages of finish starting at a and ending at j. A filter mouthpiece which undergoes a series of treatments (namely which goes through different stages of filling with filter material for tobacco smoke) includes a section of wrapping material here shown as a cylindrical sleeve or tube 11 made of paper or any other suitable material and being convertible (fillable) into a tubular envelope 37 of the finished filter mouthpiece. A central portion of the sleeve 11 contains a plug or wad 19 of a first filter material which is located in a predetermined axial position of the sleeve by a lower pusher or plunger 18 that enters the sleeve from below at b.

Appl. No. 10/057,929
Amendment dated March 2, 2004
Reply to Office Action of January 2, 2004

Page 15, please amend the paragraph beginning on line 18 and ending on page 16, line 5 as follows:

If the plug 19 is bonded to the internal surface of the sleeve 11 in a manner not shown in Fig. 1, the lower plunger 18 serves to hold the sleeve and the plug in a selected axial position, i.e., the axial position of the sleeve 11 is determined by the plunger 18 in that it maintains the plug 19 at a preselected level. The sleeve 11 is assumed to be borne by a suitable conveyor; for example, it can be at least partially confined in a complementary bore or hole or flute 16 of an indexible drum-shaped conveyor 12 (see Fig. [[4]] 6). The conveyor 12 can operate with suction (see the suction ports 13) to attract the sleeve 11 to the surface surrounding the respective hole or flute 16.

Page 16, please amend the paragraph beginning on line 6 and ending on line 21 as follows:

The lower plunger 18 has entered the sleeve 11 at the position b shown in Fig. 1 following the position a which the sleeve assumes immediately upon entry or prior to entry into the hole or flute 16. A renewed indexing of the conveyor 12 including the hole or flute 16 causes the sleeve 11 to assume the position c of Fig. 1 in which the sleeve receives a supply 26 of first granular and/or pulverulent filter material for tobacco smoke. The admission of the supply 26 is assumed to have taken place through one of the bores or holes or passages 14 of a first pusher 24 (see Fig. [[4]] 6) or through one of the holes or bores or passages 14' of a second pusher 42 which is shown in Fig. 5. Reference may be had to the aforementioned copending US patent application Serial No. (Attorney Docket: 31976-177336) which was filed jointly with this application.

Page 18, please amend the paragraph beginning on line 3 and ending on line 7 as follows:

Fig. [[2]] 4 shows the stop 29 in the same (desired or optimal) axial position relative to the collar 31 as Fig. 1. On the other hand, Fig. [[3]] 5 shows the stop 29 in a (lower end) position of actual abutment with the collar 31.

Page 18, please amend the paragraph beginning on line 8 and ending on page 19, line 11 as follows:

Fig. 1 Figs. 2 and 3 further shows several additional stages of making a composite filter mouthpiece. At e, the sleeve 11 is without the plug 20 and the exact quantity of flowable filter material 26 is yet to be determined. When at f, the flowable filter material 26 has an axial length which equals or approximates 5 mm and which is assumed to be the optimum height. If the axial length 15 of the flowable filter material 26 departs from the optimum axial length by 0.5 mm (see the position g), i.e., by approximately 10%, a conventional filter mouthpiece making machine inserts the plug 20 in such a way that the the axial position of the plug 20 is proper, i.e., the inserted mass of flowable filter material 19 has room to rattle because the allotted space exceeds the required space (for such less than optimal quantity) by 0.5 mm, i.e., by more than 10%. This is undesirable because the finished composite filter mouthpiece is "noisy" as well as because the contact between the particles of flowable filter material 26 and tobacco smoke flowing into the mouth of the smoker is less satisfactory than when tobacco smoke is caused to flow through a filter mouthpiece including the plugs and the flowable filter material shown at f. The filtering action of a flowable filter material which cannot move relative to the sleeve and the adjacent plugs or wads is more satisfactory than that of the flowable filter material which can move relative to the adjacent plugs in response to shaking or analogous movements of the finished filter mouthpiece.

Page 19, please amend the paragraph beginning on line 12 and ending on page 20, line 4 as follows:

In accordance with a feature of the present invention, the problems encountered by utilizing a "noisy" filter mouthpiece of the type shown at h are overcome by causing the plug 20 to descend to a level directly above the top layer of the shorter-than-desired supply 26 of flowable filter material shown at h. Thus, the wad has been caused to descend to a level which is necessary to eliminate the 0.5 mm gap shown at h. It is assumed that the elimination of such gap necessitates a

lowering of the stop 29 to the level of Fig. [[3]] 5, i.e., to a position of actual abutment with the upper end face of the collar 31. Such lowering of the stop 29 is caused by the coil spring 28 which reacts against the underside of the collar 31 and bears upon the end face at the upper end of the main portion of the upper plunger 17. The axial position of the plunger 17 is determined by the guide groove 44 of the fastener 32 the level of which determines the lower end position of the plunger 17.

Page 20, please amend the paragraph beginning on line 5 and ending on line 14 as follows:

In accordance with a further feature of the present invention, a filter mouthpiece wherein the axial length of the column 26 of flowable filter material which is still free to rattle when the stop 29 abuts the collar 31 is less than 4.5 mm is segregated from satisfactory filter mouthpieces. Such segregation is effected by resorting to one or more sensors or monitoring means, e.g., to one or more sensors of the type shown in and about to be described hereinafter with reference to Figs. [[4]] 6 and [[5]] 7.

Page 21, please amend the paragraph beginning on line 13 and ending on page 22, line 3 as follows:

The manner in which a sleeve can be turned upside down upon completion of the treatment shown at f or i in Fig. 1 Figs. 2 or 3 is shown in and described with reference to Fig. 14 in each of the commonly owned copending US patent application Serial No. (Attorney Docket: 31976-177336) to which reference may be had, if necessary. Once the inversion of a sleeve 11 (with a plug 19, supply 26 and plug 20 therein) is completed, the (then) upwardly extending empty portion lla of the inverted sleeve receives a metered quantity 26 of flowable filter material and a plug 20 in such order. This completes the making of a filter mouthpiece of double unit length which is ready to be severed midway across the plug 19 to yield two filter mouthpieces of unit length each containing one-half of a sleeve 11, one-half of a plug 19, a supply 26 and a plug 20.

Appl. No. 10/057,929
Amendment dated March 2, 2004
Reply to Office Action of January 2, 2004

Page 22, please amend the paragraph beginning on line 4 and ending on line 10 as follows:

Fig. [[4]] 6 illustrates certain details of a modified machine for the making of composite filter mouthpieces. The structure which is actually shown in Fig. [[4]] 6 includes several parts which are identical with or plainly analogous to some of those shown in Fig. 1 as well as certain parts having no equivalents in the machine of Fig. 1.

Page 22, please amend the paragraph beginning on line 11 and ending on page 23, line 6 as follows:

The lower plunger 18 of the machine shown in Fig. [[4]] 6 is illustrated in an axial position in which its upper end portion is already received in the bore or hole or flute 16 of the drum-shaped indexible conveyor 12. The latter is provided with the aforementioned suction ports 13 which hold the sleeve 11 in its bore or flute 16 during certain stages of angular movement of the conveyor 12 about its axis. These suction ports serve to transfer the sleeve 11 from a second drum-shaped indexible conveyor 10 which is shown in Fig. [[5]] 7. The upper plunger 17 extends through one of the bores or holes 14 in the pusher 24 and through a tube 15 which latter extends through registering bores or holes in pushers 23, 24 and a bore or hole in a plate-like conveyor 22 serving to deliver filter plugs 30. The pusher 23 contains filter plugs 20 and 30 in bores 14a for introduction into the second half of the partially filled sleeve 11. Additional flowable filter materials 26 and 27 are delivered into the bores or holes 14 of the pusher 24 at a further admitting station of the filter mouthpiece making machine embodying the structure of Fig. [[4]] 6.

Page 23, please amend the paragraph beginning on line 7 and ending on line 16 as follows:

In the embodiment of Fig. [[4]] 6, a plug 30 and a metered quantity of flowable filter material 26 are introduced into a sleeve 11 in a first step, and such sleeve receives a second plug 20 and a second metered quantity of flowable filter material 27 in a second step. A sensor 43 (such as a contact sensor) is provided on or at the shoulder 31 of the hollow shaft 25 in the path of downward movement of the stop 29 (or on the stop 29). In the embodiment of Fig. [[4]] 6, the sensor 43 is stationary relative to the hollow shaft 25.

Page 23, please amend the paragraph beginning on line 17 and ending on page 24, line 16 as follows:

If the stop 29 of the structure shown in Fig. [[4]] 6 descends into engagement with the sensor 43, this establishes a path for the flow of electric current for initiation of visual indication by a non-illustrated signal generating device (such as a light source and/or a source of audible signals). When the stop 29 engages the sensor 43, the thus obtained signal or signals is or are indicative of the presence of a defective filter mouthpiece, i.e., of the fact that the quantity of at least one batch of flowable filter material insufficient and/or that the axial length of at least one filter plug or wad is below a normal or optimum or desired axial length. If the filter plugs are satisfactory, the defect consists in that the axial length of at least one batch or supply of flowable filter material in a sleeve 11 is below the desired or acceptable axial length. The signal is utilized to segregate (e.g., pneumatically expel) the corresponding defective filter mouthpiece(s) from the preceding and from the next-following (satisfactory) filter mouthpieces, i.e., the defective filter mouthpiece(s) cannot reach the filter tipping machine, e.g., a machine of the type disclosed in the aforementioned commonly owned US patent No. 5,135,008 to Oesterling et al.

Page 24, please amend the paragraph beginning on line 17 and ending on page 25, line 10 as follows:

Fig. [[5]] 7 shows certain component parts of a further filter mouthpiece making machine which employs two additional (e.g., plate-like) pushers 41, 42 with bores 14a' and 14', respectively, disposed between the pusher 24 and the indexible drum-shaped conveyor 12. Such additional pushers render it possible to make filter mouthpieces of the type containing four different filter materials for tobacco smoke. The upper plunger 17 is not guided in a groove (see the groove 44 in Fig. 1) but is rather guided and moved by an electric motor 36 or another suitable prime mover. The motor 35 transmits torque to a gear 35 by way of a spiral spring 40. The gear 35 mates with a toothed rack 34 which is connected to the upper plunger 17 by way of a piezoelectric element 38. Such connection renders it possible to utilize a force sensor or power sensor, which monitors the torque of the prime mover 36, in addition to or in lieu of the piezoelectric element, i.e., to ascertain the force which is required to move various plugs and/or machine parts. An evaluation of such

Appl. No. 10/057,929
Amendment dated March 2, 2004
Reply to Office Action of January 2, 2004

information renders it possible to draw conclusions concerning the quality of the filter mouthpieces.

Page 25, please amend the paragraph beginning on line 11 and ending on page 26, line 3 as follows:

The function of the coil spring 28 in the machine of Fig. [[5]] 7 corresponds to that of the similarly referenced coil spring in the apparatus of Fig. [[4]] 6. The spring 28 of Fig. [[5]] 7 bears upon a distance monitoring sensor 39 which is mounted on a shoulder 31 provided on the toothed rack 34 or on the upper plunger 17. For example, the sensor 39 can monitor the distance of the upper side of the conveyor 22 (which delivers filter plugs 20) from the location of such sensor; this is indicative of the extent of movement of the upper plunger 17 in a downward direction (toward the sleeve 11). If a preselected or predetermined minimal distance is exceeded, the signal from the sensor 39 can be utilized to segregate the respective (presumably or actually unsatisfactory) filter mouthpiece(s) from satisfactory mouthpieces. The distance monitoring sensor 39 can constitute or employ an optical sensor, an ultrasonic sensor or a capacitive sensor.

Page 26, please amend the paragraph beginning on line 4 and ending on page 17 as follows:

It is possible to modify the machine of Fig. [[5]] 7 in such a way that the coil spring 28 (or an equivalent thereof) is omitted. Its function can be taken over by the spiral spring 40. If the spring 40 is also omitted, the machine of Fig. 5 can employ an electronic distance monitoring device which can evaluate the distance covered by the upper plunger 17 and/or the magnitude of the force being required to move the plunger. Such force measurement can involve a determination of the torque being transmitted by the prime mover or a determination of the force being monitored by the piezoelectric element 38. In the latter instance, the machine of Fig. [[5]] 7 employs a suitable signal processing unit and an electronic control unit.

Appl. No. 10/057,929

Amendment dated March 2, 2004

Reply to Office Action of January 2, 2004

Page 26, please amend the paragraph beginning on line 18 and ending on page 27, line 3 as follows:

A difference between the embodiments of Figs. 1 to [[4]] 6 on the one hand, and the embodiment of Fig. [[5]] 7 on the other hand, is that the machines of Figs. 1 and [[4]] 6 employ a compensating means (25, 28, 40) which operates between the plunger (transfer device) 17 and the guide means 44, 144. On the other hand, the machine embodying the structure of Fig. [[5]] 7 employs a control element (including the motor 36) which constitutes a means for facilitating only indirect movements of the mobile device (plunger 17) for introduction of filter material into the section (sleeve) 11 of wrapping material.

Page 27, please amend the paragraph beginning on line 4 and ending on line 23 as follows:

The parts 25, 28 of the machines shown in Figs. 1 and [[4]] 6 or the part 40 of the machine shown in Fig. [[5]] 7 can be said to constitute a compensating device or compensating means the primary purpose of which is to compensate for differences in the heights of cellulose acetate plugs or wads or segments or elements and correspondingly differently high paper segments and fleece segments as well as different fillers of granulate. For example, if the quantity of flowable filter material is insufficient, the absence of compensating means would result in such introduction of a plug 20 or 30 that the sleeve 11 would contain an empty space (as shown at h in Fig. [[1]] 3) which could enable the flowable filter material 26 to rattle in the finished filter mouthpiece. The compensating means (25, 28) ensures that the plug 20 descends to the level shown at j in Fig. [[1]] 3 so that the supply 26 of flowable filter material is held between the plugs 19 and 20 without any, or without any appreciable, freedom of movement and resultant generation of noise.

Appl. No. 10/057,929

Amendment dated March 2, 2004

Reply to Office Action of January 2, 2004

Page 29, please amend the paragraph beginning on line 1 and ending on line 10 as follows:

It is also possible to replace the motor 36 of Fig. [[5]] 7 with an electromagnetic power generator. To this end, at least a portion of the compensating means should consist of a metallic material. This renders it possible to establish a so-called eddy current braking function. At least a portion of the compensating means is or can be magnetizable or magnetized. It is also possible to employ pneumatically operated compensating means. Still further, it is possible to employ a gravity-operated compensating means.